Manuals+ — User Manuals Simplified.

verizon Advanced Robotics Project Owner's Manual

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Contents

Overview

This lesson should take 1 class period, or about 50 minutes to complete. The project as whole is 6 lessons and will take 2-3 weeks to complete.

This is an applied project where your students will identify a user from within their community, then use the design thinking process to create a project that solves their user's problem. In Lesson 1, each student will learn about the project overview. Then, they will choose the end user they want to work with for the remaining lessons in the project!

Lesson objectives

Students will be able to:

- Define the who, what, and how of the Unit 4 Project
- Choose a user in your community to solve a problem for with your Project

Materials

To complete this Lesson, students will need:

- Laptop/tablet
- Student worksheet

Standards

- Common Core State Standards (CCSS) – ELA Anchors: W.10
- Common Core State Standards (CCSS) – Mathematical Practice: 1, 2
- Next Generation Science Standards (NGSS) – Science and Engineering Practices: 1, 5, 8
- International Society for Technology in Education (ISTE): 3, 4, 5, 6
- National Content Standards for Entrepreneurship Education (NCEE): 1, 2, 3, 5

Key vocabulary

- **Empathize:** understand a user's wants and needs from their point of view.
- **Sustainability:** Practices that can be carried out over and over without permanently damaging society, environments, or businesses

Before you begin

- Gather necessary materials (or ensure remote students can access needed materials)
- **Review the "Lesson 1:** Project Overview" presentation, rubric, and/or lesson module.
- Consider if you want to assign students to a specific project/end user, allow students time to read the project overview and make a choice, or work on a single project as a class!

Lesson Procedures

Welcome and Introductions (2 Minutes)

- Welcome students to class. Use the included presentations, or direct students to the teleguided SCORM module if you chose to post it on your Learning Management System. Explain to students that they will be exploring the Unit 3 project today. By the end of class, students will choose an end user they would like to work with.
  Warm-up, Projects A, B, and C (2 minutes each)
  Match the stages of Design Thinking on the left with the definitions on the right.

Choices	Matches
Empathize	First Step. Understand why user acts and feels a certain way to help identify their needs.
Define	Second Step. Describe the problem clearly
Ideate	Third Step. Generate a range of creative solutions quickly
Prototype	Fourth Step. Simple, quickly-made models used to test out an idea.
Test	Fifth Step. Evaluate prototypes and improve them
Feedback	Sixth Step. Asking user or peers for information on prototype to further improve or adjust

Who, What and How for Projects A, B, and C (5 minutes each)

After students complete the warm-up, they will learn about the who, what and how for the project. Notice that the project involves finding an interview a real person in the community! Teachers may want to compile a list of "backup" volunteers that could serve as students' users in case a student can't find someone for their project.

Who: Do you know someone that could use a robotic or AI solution to help them with a particular sustainability issue? All of us are equally supported by pursuing and achieving Sustainable Development Goals but here are some specific examples of users that might be in your community who could use an autonomous robotic solution:

- Restaurant owner (food delivery, table cleanup, dishwashing)
- Park Managers (help clean up the parks, educate others about park information)
- Doctors or nurses (portable patient records and/or medications)
- Teachers or professors (grading assistants, portable Wi-Fi hot spots)
- Construction (clean up in construction yard, assistance with safe building)
- City leaders (public service announcements)
- Zookeeper (caring for animals, feeding animals)

What: The goal is to create an autonomous RVR to help someone in your community address a sustainability issue. Some advantages of using robotics and AI to address sustainability issues include the ability to send robots into places that are unsafe or dangerous for humans and also the convenience of automating repetitive tasks!

How: Students will complete the following tasks over the course of this project:

1. Find a user, ask their permission, interview the user, and create an empathy map and problem statement.
2. Ideate and sketch ideas for a RVR solution to the problem statement.
3. Put together a budget for the prototype.
4. Create a prototype of the project that meets various design and coding requirements.
5. Gather feedback from the user on the prototype, then iterate and improve the prototype accordingly.
6. Create an Adobe Spark (or other platform) video pitch presentation that walks the audience through the entire design process and explains why the prototype meets the user's needs.

Project Examples (5 minutes each)
Students will review examples of the type of project they choose. This will give them a tangible idea of the types of deliverables they will be creating. Make sure students are sure what user they are focusing on.

All examples are embedded in both the presentations and self-guided modules

Wrap Up, Deliverable, and Assessment (5 Minutes)

- **Wrap up:** If time permits, allow students to discuss who they want to pick for their user. Do students work in pairs or teams of four with the same use?
- **Deliverable:** There is no deliverable for this lesson. The goal is for students to choose one of the project options.
- **Assessment:** There is no assessment for this lesson. The goal is for students to choose one of the project options.

Differentiation

- **Additional Support #1:** For ease of facilitation, you may choose to have all students work with the same end user.
- **Additional Support #2:** You may choose to act as the "end-user" yourself. Can the students design a product for you?
- **Extension:** Couple this project with a "shadowing" experience where students shadow and observe a real professional, and then complete their project for that person!

Documents / Resources

Verizon Innovative Learning Lab Program **Artificial Intelligence & Robotics** Lesson Facilitator Guide: Advanced Robotics Project: Project Overview verizon ASU	**verizon Advanced Robotics Project** [pdf] Owner's Manual Advanced Robotics Project, Robotics Project, Project